

ENCLOSURE 1

CONTROL SYSTEMS

25.671 General

(a) Each control and control system must operate with the ease, smoothness, and positiveness appropriate to its function. The flight control system shall be designed to continue to operate and must not hinder aircraft recovery from any attitude.

(b) Each element of each flight control system must be designed to minimize the probability of incorrect assembly that could result in failure of the system to perform its intended function. Distinctive and permanent marking may be used only where design means are impractical.

(c) The airplane must be shown by analysis, test, or both, to be capable of continued safe flight and landing after any of the following failures, including jamming, in the flight control system and surfaces (including trim, lift, drag, and feel systems) within the normal flight envelope, without requiring exceptional piloting skill or strength. Probable failures must have only minor effects and must be capable of being readily counteracted by the pilot.

- (1) Any single failure, excluding failures of the type defined in (c)(3).
- (2) Any combination of failures not shown to be extremely improbable. Furthermore, in the presence of any single failure in the flight control system, any additional failure states that could prevent continued safe flight and landing shall have a combined probability of less than 1 in 1000. This paragraph excludes failures of the type defined in (c)(3).
- (3) Any failure or event that results in a jam of a flight control surface or pilot control that is fixed in position due to a physical interference. The jam must be evaluated as follows:
 - (i) The jam must be considered at any normally encountered position.
 - (ii) The causal failure or failures must be assumed to occur anywhere within the normal flight envelope except during the time immediately before landing where recovery may not be achievable when considering time delays in initiating recovery.
 - (iii) In the presence of a jam considered under this sub-paragraph, any additional failure states that could prevent continued safe flight and landing shall have a combined probability of less than 1 in 1000.
- (4) Any runaway of a flight control to an adverse position if such runaway could be due to a single failure, or due to a combination of failures that is not extremely improbable.

(d) The airplane must be designed so that it is controllable and an approach and flare to a landing possible if all engines fail at any point in the flight. Compliance with this requirement may be shown by analysis where that method has been shown to be reliable.

(e) The system design must ensure that the flight crew is made suitably aware whenever the primary control means nears the limit of control authority.

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(f) If the design of the flight control system has multiple modes of operation, a means must be provided to indicate to the crew any mode that significantly changes or degrades the normal handling or operational characteristics of the airplane.